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Iron ores — Determination of loss on ignition — Non-oxidised ores

Minerais de fer — Détermination de la perte au feu — Minerais non oxydés

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Foreword

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The committee responsible for this document is ISO/TC 102, *Iron ore and direct reduced iron*, Subcommittee SC 2, *Chemical analysis*.

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Introduction

The measurement of loss on ignition (LOI) is a technique widely used in the iron ore industry.

Ignition loss is the sum of contributions from the mass loss of volatile compounds such as water vapour, carbon dioxide and sulphides (due to the decomposition of goethite and carbonaceous materials), and the mass gain due to oxidation [Fe(II) to Fe_2O_3]. Its use is complementary to the determination of elemental or oxide concentrations. It serves to allow for an addition of the oxides, generated at the ignition temperature, and the LOI, to arrive at total (oxide + LOI). The determination of LOI is essential in sinter plant and blast furnace balance calculations, as it is used to calculate calcinated elemental concentrations.

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Iron ores — Determination of loss on ignition — Non-oxidised ores

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1 Scope

This Technical Report describes a gravimetric method for the determination of the loss in mass of non-oxidized iron ores, when ignited at 1 000 °C.

This method is applicable to a concentration range of a mass fraction of −3,0 % to 7,0 % loss on ignition in natural iron ores, iron ore concentrates and agglomerates, and sinters.

The method is not applicable to the following:

a) processed ores containing metallic iron (direct reduced iron);

b) natural or processed ores in which the sulfur content is higher than a mass fraction of 0,2 %;

c) internationally traded ores with combined water greater than 2,5 %.

NOTE 1 Loss on ignition can be used as an estimate of combined water.

NOTE 2 This method is intended for in-house use and is not intended for referee purposes.

2 Principle

A test portion is heated in a muffle furnace at 1 000 °C for 60 min and cooled in a desiccator. The decreased mass of the test portion is then measured.

3 Reagents

During the analysis, use only reagents of recognized analytical grade.

3.1 Silica gel, dried at 105 °C for 4 h.

4 Apparatus

Ordinary laboratory apparatus and the following:

4.1 Silica, **porcelain** or **platinum crucibles**, 15 ml to 25 ml capacity, with lids.

The crucibles should be pre-conditioned in the muffle furnace at 1 000 °C for 60 min. Crucibles and lids should be stored in the desiccator (4.4) prior to use.

If platinum crucibles used for LOI analysis are to be used for flux fusions, platinum ware should be thoroughly cleaned to prevent cross-contamination.

4.2 Balance, capable of reading to the nearest 0,1 mg at the mass load of the crucible.

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